

**CLAIMS**

- 1) A method for the preparation of a modified host cell comprising the steps of
- 5 a) transfecting a host cell with at least one compound of interest to which a label is covalently coupled
- b) isolating the transfected host cell
- characterized in that the label provides to the host cell a non-inheritable trait.
- 2) A method according to claim 1, wherein isolation of the transfected host cell is
- 10 established by direct separation of the host cells containing said label from host cells not containing said label.
- 3) A method according to claims 1 to 2, wherein isolation of the transfected host cell is established by using means that can distinguish and separate said transfected
- 15 host cell containing said label from non-transfected host cells.
- 4) A method according to claims 1 to 3, wherein the label is selected from the group consisting of a fluorescent label, a luminescent label, a chemo-luminescent label, a magnetic label, an antigenic label, an enzymatic label or a radioactive label.
- 20 5) A method according to claim 3, wherein the label is a fluorescent label and the means for detection is a Fluorescent Activated Cell Sorter (FACS).
- 6) A method according to claims 1 to 5, wherein the transfected host cell of step b)
- 25 is subsequently cultured.
- 7) A method according to claims 1 to 6 wherein the compound of interest is a compound able to change permanently or transiently a metabolic property of the host cell.
- 30 8) A method according to claims 1 to 7 wherein the compound of interest is selected from the group consisting of polynucleotides, proteins and metabolites.

- 9) A method according to claims 1 to 8 wherein the modified host cell is a prokaryotic cell, a eukaryotic cell, a mammalian cell or a plant cell.
- 10) A method for the preparation of a desired compound by a transformed host cell comprising the steps of
- 5 a) transfecting a host with at least one polynucleotide involved the production of said desired compound and which is covalently coupled to a label which provides to the host cell a non-inheritable trait
- b) isolating the transfected host
- 10 c) culturing the transfected host under proliferating conditions
- d) culturing the transfected host under conditions wherein the desired compound is produced
- e) isolating the desired compound from the culture broth.
- 11) A method according to claim 10 wherein the polynucleotide is selected from the group consisting of DNA, RNA, short hairpin RNA, non-coding RNA, LNA, HNA, PNA.
- 12) A method according to claims 10 to 11 wherein the polynucleotide modifies the titer, stability, isolation and/or activity of said desired compound.
- 20 13) A method according to claims 10 to 12 wherein the desired compound is a protein.
- 14) A method according to claims 10 to 13 wherein the desired compound is an enzyme.
- 25 15) A method for the preparation of a desired metabolite by a transformed host cell comprising the steps of
- 30 a) transfecting a host cell with at least one polynucleotide involved in the production of said desired metabolite and which is covalently coupled to a label which provides to the host cell a non-inheritable trait
- b) isolating the transfected host cell
- c) culturing the transfected host cell under proliferating conditions

- d) culturing the transfected host cell under conditions wherein the desired metabolite is produced
- e) isolating the desired metabolite from the culture broth.

- 5      16) A method according to claim 15 wherein the polynucleotide is selected from the group consisting of DNA, RNA, short hairpin RNA, non-coding RNA, LNA, HNA, PNA.
- 10      17) A method according to claims 15 to 16, wherein the desired metabolite is a primary metabolite.
- 18) A method according to claims 15 to 16, wherein the desired metabolite is an amino acid, a steroid or a nucleotide.
- 15      19) A method according to claims 15 to 16, wherein the desired metabolite is a secondary metabolite.
- 20      20) A method according to claim 19, wherein the desired secondary metabolite is an antibiotic, a vitamin, an anti-infective, a macrolide, a polyketide, a pheromone, an alkaloid or a drug.
- 25      21) A method for the preparation of a desired biomass by a transformed host cell comprising the steps of
- a) transfecting a host cell with at least one polynucleotide involved in the production of said desired biomass and which is covalently coupled to a label which provides to the host cell a non-inheritable trait
  - b) isolating the transfected host
  - c) culturing the transfected host under proliferating conditions
  - d) culturing the transfected host under conditions wherein the desired biomass is produced
  - e) isolating the desired biomass.
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- 22) A method according to claim 21 wherein the polynucleotide is selected from the group consisting of DNA, RNA, short hairpin RNA, non-coding RNA, LNA, HNA, PNA.
- 5 23) A method according to claims 21 to 22, wherein the desired biomass is a yeast cell.
- 24) A method according to claims 21 to 23, wherein the desired biomass comprises a biocatalyst.
- 10 25) A method according to claims 21 to 24, wherein the desired biomass comprises screenable cells for drug discovery.
- 15 26) A polynucleotide for use in a method according to claims 15 to 20, which modifies the cellular metabolism via redirecting metabolic fluxes towards said metabolite.